**LAUNCH YOUR CAREER TO A FLYING START WITH QANTAS**

**About Qantas**

Qantas is Australia's largest domestic airline and one of the world's leading long distance carriers. This iconic brand has been built on a reputation of excellence in safety, operational reliability, engineering and maintenance and exceptional customer service.

Qantas proudly recognises the value and the dedication of its employees across the globe and is one of the largest employers in Australia. As such, Qantas is committed to the development of highly motivated undergraduate students.

**About the Program**

This twelve week paid program provides students the opportunity to gain valuable skills and knowledge by contributing to real business projects within our large and complex organisation.

Throughout the twelve weeks students will:

- be assigned to a business project and play an integral part in the achievement of desired outcomes;

- participate in business unit studies to enhance overall corporate knowledge; and

- receive coaching and mentoring by senior business professionals who will expose them to a wide range of issues currently challenging the aviation and airline industry.

The 2013/2014 Qantas Engineering Summer School Program will run from **25 November 2013** until **28 February 2014** (with a break over the Christmas/New Year period).

*Please note this year's program will be based in Sydney and as such, successful candidates from interstate will be required to make their own accommodation arrangements however flights will be provided by Qantas at the beginning and end and for the Christmas/New Year break.*

**About You**
- You are in your third or fourth year of undergraduate studies in one of the following disciplines:
  - ➢ Aeronautical Engineering
  - ➢ Computer Science
  - ➢ Mechanical Engineering
  - ➢ Electrical Engineering
  - ➢ Mechatronics
- You have achieved a credit average or above throughout the course of your studies;
- You must be an Australian/New Zealand Citizen or Permanent Resident;
- You are a highly motivated, energetic and ambitious individual;
- You possess strong verbal and written communications and have the ability to liaise and present to all levels;
- You have high analytical skills with the ability to solve complex problems by thinking laterally; and
- You have a genuine interest in the Airline/Aviation Industry.

Qantas is an Equal Opportunity Employer, and we invite you to be part of an organisation that fosters a diverse workplace, supports many charities and environmental initiatives, and is actively committed to Australia's youth, the arts and sport. Aboriginal and Torres Strait Islander people are encouraged to apply.

**List of Projects**

1. **POINT MASS MODEL SIMULATOR -** Department: Fleet Development/Performance Engineering

   **SHORT DESCRIPTION**

   Qantas Performance Engineering is currently working on a project to deliver a mobile solution to be used by flight crew on long haul transpacific flights. The objective of the project is to provide additional information to assist in the tactical fuel management decision making process of the pilot. The project will involve coding a defined point mass model using aerodynamic, thermodynamic and Flight Management Computer (FMC) logic to simulate the fuel burn characteristics of an aircraft during the sector. Time permitting; the student could be involved in integrating the point mass model library into an IOS 7 application which is being developed concurrently.

   **DISCIPLINE REQUIRED**

   To be successful in delivering the project outcomes, the student would require strong C/C++ programming skills with a sound understanding of basic aerodynamics.

2. **FUEL FREEZE SIMULATOR -** Department:  Fleet Development/Performance Engineering

   **SHORT DESCRIPTION**

   Qantas Performance Engineering is currently working with Flight Operations in the development of a new Flight Planning solution with a local University. As part of the optimisation process, the Flight Planner must simulate the individual tank temperatures in order to ensure that the aircraft does not encounter a fuel freeze scenario. This can be quite sensitive on long haul operations, as well as polar operations.

   Current Fuel Freeze software delivered by the manufacturers are run independently of the Flight Planner and just provide a tank temperature given a routing, without being able to influence the routing so that Fuel Freeze is avoided.

   We would require the development of an elementary Fuel Freeze logic that would be fully integrated into Flight Planning system on a node to node calculation. Both the Fuel Transfer and Heat Transfer logic must be encapsulated.

   **DISCIPLINE REQUIRED**

   Computer Science or Aeronautical/Mechatronic Student with strong Computer Programming skills.

3. **AIRCRAFT DELAY PREDICTOR -** Department:  Fleet Development

   **SHORT DESCRIPTION**

   In conjunction with the current research being conducted on predicting Technical Log activity, create Software that accepts Aircraft Allocation and Aircraft Schedule as an input, and outputs the predicted amount of Tech Log entries.

   Further refinement of Schedule and Aircraft Allocation optimization will also be explored.

   **DISCIPLINE REQUIRED**

   Computer Science or Aeronautical/Mechatronics with strong Computer Programming skills.

4. **FLEET STRATEGY TOOL -** Department:  Fleet Development

   **SHORT DESCRIPTION**

   In conjunction with the current Qantas research being conducted in this area, participate in mining company and publicly available economic and passenger movement data to create a multi-constraint Fleet Strategy Optimiser Proof of Concept. This will require careful research in existing publicly available models, as well as documenting all possible variables that influence the choice of aircraft and network.

   **DISCIPLINE REQUIRED**

   To be successful in delivering the project outcomes, the following are required:

   - One student would require a degree in Economics and Commerce. A double Engineering and Commerce degree as well as notions of Computer Programming (Java/C++) is a plus.
   - One student would require strong C/C++ or Java programming skills as well as the ability to conceptualise problems.

5. **TERADATA APPLICATION FOR AIRCRAFT EVALUATION AND WEIGHTS ENGINEERING -** Department:  Fleet Development/Weights Engineering

   **SHORT DESCRIPTION**

   Development of a software application that will access Teradata for aircraft evaluation and weight and balance support. It will also be used for aircraft performance guarantees and fuel conservation initiatives. This is achieved by using statistical data for identification of weight reduction initiatives and optimisation of aircraft performance capabilities. In addition, it will automate our existing processes of extracting and processing statistical data, particularly load sheets that are generated by Load Control (weight distribution, centre of gravity).

   **DISCIPLINE REQUIRED**

   Computer Science or Aeronautical/Mechatronic Student with strong Computer Programming skills.

6. **WEIGHTS ENGINEERING APPLICATION – IATA AHM 565 REPORT -** Department: Fleet Development/Weights Engineering

   **SHORT DESCRIPTION**

   Ongoing development of the Weight Engineering Application (WEA) for the production of IATA AHM 565 Reports. The application will be used to produce weight and balance data in accordance with the IATA recommendations and standards. It will also be supplied to customer airlines that have requested for Qantas Engineering Services to develop their loading schedule.

   **DISCIPLINE REQUIRED**

   Computer Science or Aeronautical/Mechatronics and good Computer Programming skills.

7. **AIRCRAFT TPED TESTING -** Department:  Aircraft Design and Projects

   **SHORT DESCRIPTION**

   Portable electronic devices (PEDs) fall into two main categories: non-intentional transmitters and intentional transmitters. Electronic devices that are intentional transmitters are referred to as Transmitting

Portable Electronic Devices (TPEDs) and may induce interference directly into aircraft equipment, wiring or components and have the ability to affect proper functioning of aircraft systems.

Current regulatory requirements for the operation of commercial aircraft prohibit the use of TPEDs on board an aircraft when the engines are running, and where the device may impair the functioning of the aircraft systems or equipment. Therefore the onus for determining if passenger-operated electronic devices will cause interference is placed on the air operator. Normally, the air operator would determine the safety of TPED operation by performing and electromagnetic compatibility (EMC) test.

As the project lead you will:

- Develop a software program that can analyse a subject fleet aircraft's TPED configuration
- Develop a standard test plan/report template
- Develop a central reporting tool for regulators and internal stakeholders
- Develop a tooling and equipment capability list needed for each fleet
- Participate in aircraft TPED tests to validate reports and tools

**DISCIPLINE REQUIRED**

Electrical Engineering

8. **DEVELOPMENT OF AN ELA TOOL (ELA-X) -** Department:  Aircraft Systems

   **SHORT DESCRIPTION**

   This project involves reviewing current processes for carrying out Electrical Load Analysis (ELA) on Qantas fleet aircraft, then developing a consolidated tool for tracking ELA changes due to aircraft modifications.

   CASA Airworthiness Bulletin 24-7 Issue 4 stipulates that an ELA is required for all aircraft fitted with an electrical system to ensure that the demand on the aircraft's electrical system does not result in the undesirable situation that, during operations in the most onerous circumstances, the electrical system would be inadequate in meeting those system demands or where the emergency reserves are insufficient to meet the requirements during an emergency. FAA AC 21-38(0) also provides guidance on a method of performing such an analysis.

   As the project lead you will be liaising with various internal departments, plus aircraft/equipment manufacturers, and then utilising your computer programming skills to build a tool for use within the wider Qantas Engineering community.

   **DISCIPLINE REQUIRED**

   Computer Science or Electrical Student with strong Computer Programming skills.

9. **DEVELOPMENT OF WATER SAMPLING - STATISTICAL PROCESS TOOL** - Department: Cabin Systems

   **SHORT DESCRIPTION**

   The U.S. Environmental Protection Agency (EPA) implemented an "Aircraft Drinking Water Rule" (ADWR) that applies to airline carriers operating in the USA. The primary purpose of the ADWR is to ensure that a safe and reliable supply of drinking water is provided to aircraft passengers and crew. The rule applies to aircraft that are public water systems (PWSs) and requires that the water provided through lavatory and galley faucets and drinking fountains on the aircraft must meet standards for human consumption.

   As the project lead you will:

- Develop a software program that can record and track water quality by specific aircraft and subject galley/lavatory systems
- Develop a statistical process control method to analyse water samples and process methods
- Develop a central reporting tool for regulators and internal stakeholders
- Review and recommend improvements to the water sampling program to minimise disruptions to operations and reduce unnecessary maintenance costs

**DISCIPLINE REQUIRED**

Aeronautical/\Mechanical/Environmental Engineering with strong Computer Programming skills

10.**ENGINE HEALTH MONITORING ENHANCEMENT –** Department:  Fleet Engines

**SHORT DESCRIPTION**

Current generation engines are maintained on-condition.  A key component of this is engine health monitoring (EHM) which is hosted by manufacturer (Rolls-Royce and General Electric) programs.  There is an opportunity to enhance this by supplementing it with data collected continuously and stored on the aircraft Quick Access Recorder (QAR).

**DISCIPLINE REQUIRED**

Mechanical/Aero Engineering

11.**ENGINE MAINTENANCE COST ANALYSIS –** Department:  Fleet Engines

**SHORT DESCRIPTION**

Good asset management requires knowing what the Direct Maintenance Cost (DMC) of an engine is.  A standardised approach is required for all engine fleets so that comparisons can be made between the various engine fleets.  The aim of this project is to establish the process for determining DMC for the engine and APU fleets and to quantify these for several fleets currently in Qantas service.

**DISCIPLINE REQUIRED**

Mechanical/Aero Engineering

**Applications close midnight Sunday, 27 October 2013.**

Embrace the Spirit and submit your application today using the link below. Please ensure that you attach an updated CV and a current results transcript.

https://qantas.taleo.net/careersection/ext3/jobdetail.ftl?job=018644

**For enquires please contact - Eileen Macpherson on 02 9691 7511 or email eileenmacpherson@qantas.com.au**